

CLAIMS

1. A method for processing information in a communication system, comprising:
partitioning a control channel used for transmitting control information into a plurality of subchannels, each subchannel being operated at a specific data rate;
selecting, for each of one or more user terminals, one of the subchannels to be used for transmitting control information from an access point to the respective user terminal, based on one or more selection criteria; and
transmitting control information from the access point to a particular user terminal on a particular subchannel selected for the respective user terminal.
2. The method of claim 1 wherein the control information is transmitted in a segment of a data frame specifically allocated for the control channel.
3. The method of claim 1 wherein each subchannel is associated with a specific set of operating parameters.
4. The method of claim 3 wherein the operating parameters are selected from the group consisting of a code rate, a modulation scheme, and a signal-to-noise ratio (SNR).
5. The method of claim 1 wherein the plurality of subchannels are transmitted sequentially in an order from a subchannel with a lowest data rate to a subchannel with a highest data rate.
6. The method of claim 5 wherein a subchannel that is transmitted first in the plurality of subchannels includes a field to indicate whether other subchannels are also being transmitted.
7. The method of claim 6 wherein the field comprises a plurality of bits each of which corresponds to a particular subchannel and is used to indicate whether the corresponding subchannel is present in the segment allocated for transmitting control information.

8. The method of claim 1 wherein the one or more selection criteria are selected from the group consisting of a first criterion corresponding to a link quality associated with the respective user terminal, a second criterion corresponding to quality of service requirements associated with the respective terminal, and a third criterion corresponding to a subchannel preference indicated by the respective terminal.
9. A method for processing information in a communication system, comprising:
 - segregating a control channel into a plurality of subchannels each of which being operable at a specific data rate;
 - transmitting control information including resource allocation information from an access point to a user terminal on particular subchannel of the plurality subchannels selected for the user terminal, based on one or more selection criteria; and
 - decoding, at the user terminal, one or more subchannels of the plurality of subchannels to obtain control information designated for the user terminal.
10. The method of claim 9 wherein decoding comprises:
 - performing a decoding procedure to decode the one or more subchannels, starting with a subchannel operated at a lowest data rate, until at least one of a plurality of conditions is met.
11. The method of claim 10 further comprising:
 - terminating the decoding procedure if one of the plurality of conditions is met.
12. The method of claim 11 wherein the plurality of conditions includes a first condition indicating a failure to correctly decode one of the plurality of subchannels.
13. The method of claim 11 wherein the plurality of conditions includes a second condition indicating that control information designated for the user terminal has been obtained from one of the plurality of subchannels.
14. The method of claim 11 wherein the plurality of conditions includes a third condition indicating that all subchannels have been processed.

15. The method of claim 10 wherein performing a decoding procedure comprises:
determining whether information transmitted on a subchannel has been correctly received, based on a quality metric corresponding to the respective subchannel.
16. The method of claim 15 wherein the quality metric comprises a cyclic redundancy check (CRC).
17. The method of claim 10 wherein performing a decoding procedure comprises:
determining whether control information designated for the user terminal is present in the respective subchannel, based on an identifier associated with the user terminal.
18. The method of claim 17 wherein the identifier comprises a Medium Access Control (MAC) identifier.
19. The method of claim 9 wherein the one or more selection criteria are selected from the group consisting of a first criterion corresponding to operating conditions of the respective user terminal, a second criterion corresponding to quality of service requirements associated with the respective terminal, and a third criterion corresponding to a subchannel preference indicated by the respective terminal.
20. An apparatus for processing information in a communication system, comprising:
means for partitioning a control channel that is used for transmitting control information into a plurality of subchannels, each subchannel being operated at a specific data rate;
means for selecting, for each of one or more user terminals, one of the subchannels to be used for transmitting control information from an access point to the respective user terminal, based on one or more selection criteria; and
means for transmitting control information from the access point to a particular user terminal on a particular subchannel selected for the respective user terminal.

21. The apparatus of claim 20 wherein each subchannel is associated with a distinct set of operating parameters including a code rate, a modulation scheme, and an SNR.

22. The apparatus of claim 20 wherein the plurality of subchannels are transmitted sequentially in an order from a subchannel with a lowest data rate to a subchannel with a highest data rate.

23. The apparatus of claim 22 wherein a subchannel that is transmitted first in the plurality of subchannels includes a field to indicate whether other subchannels are also being transmitted.

24. The apparatus of claim 20 wherein the one or more selection criteria including a first criterion corresponding to a link quality associated with the respective user terminal, a second criterion corresponding to quality of service requirements associated with the respective terminal, and a third criterion corresponding to a subchannel preference indicated by the respective terminal.

25. An apparatus for processing information in a communication system, comprising:

means for segregating a control channel into a plurality of subchannels each of which being operable at a specific data rate;

means for transmitting control information including resource allocation information from an access point to a user terminal on particular subchannel of the plurality subchannels selected for the user terminal, based on one or more selection criteria; and

means for decoding, at the user terminal, one or more subchannels of the plurality of subchannels to obtain control information designated for the user terminal.

26. The apparatus of claim 25 wherein means for decoding comprises:

means for performing a decoding procedure to decode the one or more subchannels, starting with a subchannel operated at a lowest data rate, until at least one of a plurality of conditions is met.

27. The apparatus of claim 26 wherein the plurality of conditions includes a first condition indicating a failure to correctly decode one of the plurality of subchannels, a second condition indicating that control information designated for the user terminal has been obtained from one of the plurality of subchannels, and a third condition indicating that all subchannels have been processed.

28. The apparatus of claim 25 wherein means for performing a decoding procedure comprises:

means for determining whether information transmitted on a subchannel has been correctly received, based on a quality metric corresponding to the respective subchannel; and

means for determining whether control information designated for the user terminal is present in the respective subchannel, based on an identifier associated with the user terminal.

29. The apparatus of claim 25 wherein the one or more selection criteria including a first criterion corresponding to operating conditions of the respective user terminal, a second criterion corresponding to quality of service requirements associated with the respective terminal, and a third criterion corresponding to a subchannel preference indicated by the respective terminal.

30. An apparatus for processing information in a communication system, comprising:

a controller configured to select one of a plurality of control subchannels to send control information to a user terminal, based on one or more selection criteria, each subchannel being operable at a specific data rate; and

a transmitter to send the control information designated for the user terminal on the subchannel selected for the user terminal.

31. The apparatus of claim 30 wherein each subchannel is associated with a specific set of operating parameters, including a data rate at which control information is transmitted, a code rate, a modulation scheme, and an SNR.

32. The apparatus of claim 30 wherein the plurality of subchannels are transmitted sequentially in an order from a subchannel with a lowest data rate to a subchannel with a highest data rate.

33. The apparatus of claim 30 wherein the one or more selection criteria including a first criterion corresponding to a link quality associated with the respective user terminal, a second criterion corresponding to quality of service requirements associated with the respective terminal, and a third criterion corresponding to a subchannel preference indicated by the respective terminal.

34. An apparatus for processing information in a wireless communication system, comprising:

- a receiver to receive information on one or more control subchannels each of which being operated at a specific data rate; and

- a decoder to decode the one or more control subchannels to obtain control information designated for a particular user terminal, starting with a subchannel operated at a lowest data rate, until at least one of a plurality of conditions is met.

35. The apparatus of claim 34 wherein the plurality of conditions includes a first condition indicating a failure to correctly decode one of the plurality of subchannels, a second condition indicating that control information designated for the user terminal has been obtained from one of the plurality of subchannels, and a third condition indicating that all subchannels have been processed.

36. The apparatus of claim 34 wherein the decoder is configured to determine whether information transmitted on a subchannel has been correctly received, based on a quality metric corresponding to the respective subchannel and to determine whether

control information designated for the user terminal is present in the respective subchannel, based on an identifier associated with the user terminal.

37. A machine-readable medium comprising instructions which, when executed by a machine, cause the machine to perform operations including:

- partitioning a control channel that is used for transmitting control information into a plurality of subchannels, each subchannel being operated at a specific data rate;

- selecting, for each of one or more user terminals, one of the subchannels to be used for transmitting control information from an access point to the respective user terminal, based on one or more selection criteria; and

- transmitting control information from the access point to a particular user terminal on a particular subchannel selected for the respective user terminal.

38. The machine-readable medium of claim 37 wherein each subchannel is associated with a set of operating parameters, including a data rate at which control information is transmitted, a code rate, a modulation scheme, and an SNR.

39. The machine-readable medium of claim 37 wherein the one or more selection criteria including a first criterion corresponding to a link quality associated with the respective user terminal, a second criterion corresponding to quality of service requirements associated with the respective terminal, and a third criterion corresponding to a subchannel preference indicated by the respective terminal.

40. A machine-readable medium comprising instructions which, when executed by a machine, cause the machine to perform operations including:

- receiving information on one or more control subchannels each of which being operated at a specific data rate; and

- decoding the one or more control subchannels to obtain control information designated for a particular user terminal, starting with a subchannel operated at a lowest data rate, until at least one of a plurality of conditions is met.

41. The machine-readable medium of claim 40 wherein the plurality of conditions includes a first condition indicating a failure to correctly decode one of the plurality of subchannels, a second condition indicating that control information designated for the user terminal has been obtained from one of the plurality of subchannels, and a third condition indicating that all subchannels have been processed.

42. The machine-readable medium of claim 40 wherein the decoder is configured to determine whether information transmitted on a subchannel has been correctly received, based on a quality metric corresponding to the respective subchannel and to determine whether control information designated for the user terminal is present in the respective subchannel, based on an identifier associated with the user terminal.

43. A method for processing information in a system, comprising:
receiving information on one or more control subchannels each of which being operated at a specific data rate; and
decoding the one or more control subchannels to obtain control information designated for a particular user terminal, starting with a subchannel operated at a lowest data rate, until at least one of a plurality of conditions is met.

44. The method of claim 43 wherein the plurality of conditions includes a first condition indicating a failure to correctly decode one of the plurality of subchannels, a second condition indicating that control information designated for the user terminal has been obtained from one of the plurality of subchannels, and a third condition indicating that all subchannels have been processed.

45. The method of claim 43 wherein decoding comprises:
determining whether information transmitted on a subchannel has been correctly received, based on a quality metric corresponding to the respective subchannel; and
determining whether control information designated for the user terminal is present in the respective subchannel, based on an identifier associated with the user terminal.